**Pharmacokinetics of intranasal scopolamine gel formulation during antiorthostatic bedrest - a microgravity analog**

**Singh RP, Daniels VA, Crady, CA, Derendorf H and Putcha L**

Space Motion sickness (SMS) is an age old problem for astronauts on both short and long duration space flights. Scopolamine (SCOP) is the most frequently used drug for the treatment of motion sickness (MS) which is currently available in transdermal patch and tablet dosage forms. These formulations of SCOP are ineffective for the treatment of SMS. Intranasal dosage forms are noninvasive with rapid absorption and enhanced bioavailability thus allowing precise and reduced dosing options in addition to offering rescue and treatment options. As such, an intranasal gel dosage formulation of scopolamine (INSCOP) was developed and Pharmacokinetics (PK) and bioavailability were determined under IND guidelines. The present clinical trial compares PK and bioavailability of INSCOP in 12 normal, healthy subjects (6 male/ 6 female) during ambulation (AMB) and antiorthostatic bedrest (ABR) used as a ground-based microgravity analog. Subjects received 0.2 and 0.4 mg doses of INSCOP during AMB and ABR in a four-way crossover design. Results indicated no difference between AMB and ABR in PK parameters after 0.2 mg dose. Clearance (Cls) decreased with a concomitant increase in maximum concentration and area under concentration versus time curve (AUC) during ABR after the 0.4 mg dose. This difference in AUC and Cls at the higher but not the lower dose during ABR may suggest that ABR may affect metabolism and/or clearance at higher doses of INSCOP. These results indicate that dosing adjustment may be required for treatment of SMS with INSCOP in space.